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and for the investigation of scientific methods of highway construction, following the lead, in this last respect, of the State of Massachusetts.

T. A. JAGGAR, JR.

PETROGRAPHY.

Granites and Diabases. — Milch's¹ article on the granitic rocks of the Riesengebirge and Bodmer-Beder's² paper on the olivin diabase from the Plessurgebirge in the Grisons are monographic presentations of the subjects they discuss. In the first, the author describes in great detail, and with a wealth of chemical analyses, the well-known granite of the Riesengebirge, together with its basic and acid phases and the concretions they contain. Chemically, the rock is a mixture of Rosenbusch's granitic and dioritic magmas. The acid and basic phases are regarded as differentiation products of the magma that yielded the normal rock. Even the dike granites and the pegmatites of the district are looked upon as "Schlieren" in the granitic magma, formed by the solidification of the mother liquor left after the greater portion of the magma had crystallized. The basic phases of the rock often present the features of kersantites. They appear as concretions in the granite and as dark "Schlieren" traversing it.

The diabases of the Plessurgebirge in the neighborhood of Chur occur as stocks, as horizontal sheets, and as dikes in the predominant limestone. In the center of the stocks its structure is granular; nearer the peripheries of the masses it is ophitic, and on the peripheries it is vitrophyric. Varioles and vacuoles are present as contact phenomena. The former are spherulites of radial plagioclase, and the latter amygdaloidal cavities that have been filled with albite, quartz, and calcite. The rocks present no unusual features, but the paper is worth examination because of its thoroughness in describing and picturing each structural form of the rock investigated and of its constituents.

Granitic Oceanic Islands and the Nature of Laterite. — The small group of tropical oceanic islands, known as the Seychelles, are noteworthy from the fact that they are neither of coral nor of volcanic origin, but are granitic in character. Bauer³ reports that they consist principally of granites, and syenites cut by dikes and covered

¹ *Neues Jahrb. f. Min.*, Bd. xii, p. 115.

² *Ibid.*, p. 238.

³ *Neues Jahrb. f. Min.*, etc. Bd. ii (1898), p. 163.

in places by flows of felsite-porphry, granite-porphry, syenite-porphry, hornblende-vogesite, diorites, diabase, and augite-porphry. The greatest interest of the paper lies in the discussion of the nature of the weathering product, laterite, which here, as in other tropical lands, constitutes so large a part of the rock covering. In the Seychelles this material results from the decomposition of both acid and basic rocks, but it is best developed in connection with the granite, boulders of which may consist of the fresh rock in the center and laterite on the exterior, with a complete series of gradation forms between. The typical laterite is a red, brown, or yellow mass that may be dense and hard, clay-like, or sandy and friable under different conditions. Often this substance may be mixed with quartz grains or mica scales. In thin section it is sometimes nearly opaque, sometimes completely transparent. Everything but the quartz of the granites and the ilmenite of basic rocks has been changed to a light-colored, scaly aggregate of doubly refracting plates colored in places by iron oxides and other compounds. Analyses of this substance from granite and diorite yield: 60.68% Al_2O_3 , 9.56% Fe_2O_3 , and 29.76% H_2O for granite-laterite, and 51.98% Al_2O_3 , 20.95% Fe_2O_3 , and 27.07% H_2O for diorite-laterite.

Laterite is thus very different from clay; in composition it is much more like hydrargillite. The beauxite of the Vogelsberg and other supposed beauxites derived from basalts are of the same nature. In all cases the laterite is the residue left by leaching agents in a tropical climate. The occurrence of the beauxite at Vogelsberg indicates to the author the existence of a warm climate over this place at the time the beauxite was formed.

Isenite and Intermediate Types of Volcanic Rocks.—In the Westerwald, in the province of Hesse-Nassau, basalts, trachytes, andesites, and phonolites are well developed in many different phases, especially in the transition forms that have recently attracted so much attention among petrographers. The predominant andesite, for instance, is a transition phase between andesite and trachyte; some of the other andesites are basaltic in habit, and a few of the trachytes are phonolitic. Dannenberg¹ describes all these types in detail, and adds analyses of many of them. The "isenite" from Sengelberg, Kramberg, and Himmrich consists of a groundmass made up of lath-shaped plagioclases, and small grains of augite and of olivine, magnetite, and some secondary substances, and pheno-

¹ *Min. u. Petrog. Mitth.*, Bd. xvii, pp. 301, 421.